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目次

质量控制专栏

- 辅助生殖技术质量控制管理现状.....朱依敏 615
- 应用全面质量管理体系运转法降低
辅助生殖技术刺激周期中重度
卵巢过度刺激综合征发生率.....黄洁 蔡令波 刁飞扬等 616
- 控制移植胚胎数目策略在降低北京市
体外受精-胚胎移植多胎妊娠率中
的应用及效果分析.....吴红萍 陈立雪 刘平等 621
- 辅助生殖患者就诊流程应用软件
的应用探讨.....吴红萍 马彩虹 宋东红等 625
- 辅助生殖专科护士培养模式
及实践效果分析.....张小媛 莫凤逸 鄢雨英等 628
- 国际人类辅助生殖技术监督与
质量管理模式.....刘爱霞 朱依敏 632
- 辅助生殖技术实验室的质量控制体系.....廉颖 刘平 乔杰 636
- 胚胎实验室质量控制.....方丛 梁晓燕 640
- 植入前遗传学诊断及筛查技术
的实验室质量控制体系.....黄锦 加加林 王云等 643
- 辅助生殖技术的安全核查管理与流程.....蔡令波 黄洁 刘嘉茵 647
- 辅助生殖技术实验室环境和空气质量的控制.....罗金 杨菁 649
- 取卵手术的手术室护理规范和流程管理.....刘崇媛 柴德春 652
- 医疗助理在辅助生殖专家门诊问诊患者
管理中的作用.....丁小芹 徐慧 柴德春 655
- 植入前遗传学诊断技术产生的社会伦理问题
及其监管对策.....曹云霞 郝燕 杨芳 657
- 选择性卵子冷冻若干伦理问题研究.....杨芳 曹云霞 662
- 腹腔镜手术治疗子宫内膜异位症相关
不孕症的研究进展.....杨春霞 冒韵东 667

临床研究

- 妊娠滋养细胞疾病史的不孕患者体外受精/
卵胞质内单精子显微注射结局分析.....沈曦 陈秋菊 匡延平 671
- 人类白细胞抗原基因型的胚胎植入前
遗传学诊断.....杜生荣 曾国英 孙艳等 677

实验研究

莱克多巴胺对人卵巢颗粒细胞类固醇激素合成

急性调节蛋白表达的影响江欢 朱伟杰 谢宝国 682

临床报道

不同受精方式早期自然流产物染色体异常分析张婷 洪燕 申琳等 688

综 述

C型利钠尿肽在卵细胞双相体外成熟技术中的应用李贺梅 赵义清 692

多囊卵巢综合征健康教育依从性影响因素及改善措施常亚丽 胡俊平 高明霞等 695

常用麻醉药对雄性生殖毒性的研究现状唐夏楠 杨涛 岳静等 698

告 白封三

《中华生殖与避孕杂志》第一届编辑委员会成员名单 中文目次 2

本刊稿约见本卷第 2 期封三, 第 7 期封二

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CONTENTS IN BRIEF

Quality Control Column

- Status of quality control management of assisted reproductive technology... 615
Zhu Yimin
- Application of total quality management system methods to reduce the incidence of moderate and severe ovarian hyperstimulation syndrome in assisted reproductive technology cycles 616
Huang Jie, Cai Lingbo, Diao Feiyang, et al
- Effect of controlled transferred embryo numbers on reducing *in vitro* fertilization-embryo transfer multiple pregnancy rate in Beijing 621
Wu Hongping, Chen Lixue, Liu Ping, et al
- Implementation of treatment process management application software in assisted reproductive technology patients 625
Wu Hongping, Ma Caihong, Song Donghong, et al
- Analysis of clinical training model for specialist nurses of assisted reproductive technology and the clinical practice effect 628
Zhang Xiaoyuan, Mo Fengyi, Yan Yuying, et al
- International supervision and quality management of human assisted reproductive technology 632
Liu Aixia, Zhu Yimin
- Supervision and quality management of human assisted reproductive technology laboratory 636
Lian Ying, Liu Ping, Qiao Jie
- Quality management of culture systems in *in vitro* fertilization laboratory... 640
Fang Cong, Liang Xiaoyan
- Quality management of preimplantation genetic diagnosis and preimplantation genetic screening 643
Huang Jin, Jia Jialin, Wang Yun, et al
- Management of safety verification and process of assisted reproductive technology 647
Cai Lingbo, Huang Jie, Liu Jiayin
- Quality management of environment and air quality in assisted reproductive technology laboratory 649
Luo Jin, Yang Jing
- The process and standardized management of oocyte retrieval operation in *in vitro* fertilization operating room 652
Liu Chongyuan, Chai Dechun
- Role of medical assistants in patient management of assisted reproduction specialist clinic 655
Ding Xiaoqin, Xu Hui, Chai Dechun
- Social ethical issues and countermeasures for preimplantation genetic diagnosis ... 657
Cao Yunxia, Hao Yan, Yang Fang
- Ethical evaluation on elective oocyte cryopreservation..... 662
Yang Fang, Cao Yunxia
- Advances in the treatment of infertility associated with endometriosis by laparoscopy ... 667
Yang Chunxia, Mao Yundong

Clinical Study

- Clinical outcomes of *in vitro* fertilization/intracytoplasmic sperm injection treatment in infertility women with a history of gestational trophoblastic disease 671
Shen Xi, Chen Qiuju, Kuang Yanping
- Research of preimplantation genetic diagnosis of human leukocyte antigen genotype 677
Du Shengrong, Zeng Guoying, Sun Yan, et al

Laboratory Study

- Steroidogenic acute regulatory protein expression in human granulosa cells exposed to ractopamine *in vitro* 682
Jiang Huan, Zhu Weijie, Xie Baoguo

Clinical Report

- Detection for chromosomal aberrations in early spontaneous miscarriages following different fertilization methods..... 688
Zhang Ting, Hong Yan, Shen Lin, et al

辅助生殖技术质量控制管理现状

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辅助生殖技术(ART)是成功于40年前的一类特殊医疗技术,其特殊性在于“体外制造人”诞生“试管婴儿”。“试管婴儿”的概念源于精卵结合、胚胎的早期发育在体外试管里进行。ART治疗过程还包括胚胎宫内发育早期受药物干预,此过程对出生子代健康的影响还存在许多未解之谜。随着ART的迅猛发展,ART出生子代在欧美国家约占出生人口的2%~3%,与整体人口素质密切相关而备受各界关注。我国ART经历了30余年的发展,截至2017年底已有生殖医学中心478家、人类精子库24家,实施的ART周期数居世界之最,研究目标已从初期如何提高成功率转变为如何出生健康子代。因此,加强ART的质量控制(QC)管理,降低出生缺陷风险、提高出生人口素质成为当今生殖医学领域和卫生行政管理的当务之急。

ART的QC是对助孕医疗全过程的质量把控,这就要求对ART实现全面质量管理(TQM)。ART的TQM涉及对QC的管理,包含医疗机构外部和内部管理。

生殖医学中心的外部质量管理始于上世纪80年代的欧美国家,通过法律法规明确对人类ART的各项许可、检查、处罚等,对所生育后代法律地位进行认定,促进人类ART良性、有序发展。部分国家或地区建立了国家和地区层面的数据管理监测系统,如美国要求所有注册的助孕机构都必须及时上报运行数据,2016年纳入实时上报系统,加大了对生殖中心的QC管理力度。

2001年2月我国卫生部发布了首个有关人类ART的《人类辅助生殖技术管理办法》和《人类精子库管理办法》,对申报ART的机构资质、专业技术人员的资质、医疗指征、QC指标、伦理管理要求进行规定,并于2003年6月进行了修订。近年来全国部分省市相继建立了ART的QC和改进中心,对所管辖区域辅助生殖医学中心开展人类ART进行QC和动态监控。对专业人员的基础知识、基本理论和基本技能进行规范化培训,确保人类ART和人类精子库健康、科学、有序发展。随着《医疗质量管理办法》(2016版)的颁布,生殖医学专业更需进一步将辅助生殖技术医疗质量管理做精、做细、做实,将管理办法落实到位。

近年来,我国生殖医学相关的学术团体发布了大量的临床诊疗规范和专家共识、实验室操作规范、护理操作规范、伦理管理规范等,为生殖医学中心内部质量管理的制定提供了参考。生殖中心的QC管理水平逐步提高,普遍应用ART管理软件实现病案电子化信息系统管理,进行临床和实验室数据资料统计和分析。除了一系列管理制度、标准操作规程(SOP)外,据于TQM的理念,有些生殖中心引入了ISO9000质量管理体系。各生殖中心的管理也各有特色,如江苏省人民医院建立了具有特色的“辅助生育技术的安全核查管理与操作流程”、“取卵手术的手术室护理规范和流程管理”、“医疗助理制度”等,有效保障ART的安全,降低潜在风险,提高医护服务质量;又如北京大学第三医院开发了应用软件(APP)对辅助生殖患者就诊流程进行管理,使患者与医护人员互动通道顺畅,提高了患者就诊体验及满意度。ART实验室采用标准化的质量管理工具(TQM和PDCA环)等进行管理,对环境、仪器设备、耗材试剂、人员及配子和胚胎的体外操作等各方面进行QC,有利于保证实验室工作质量的一致性和稳定性,从而优化临床治疗结局。

尽管ART的QC管理有了很大进步,但各地ART发展不平衡,有些省市尚未建立ART的QC中心,生殖中心内部QC指标体系方面还不完善,仍然存在ART适应证扩大化、临床负性指标(如多胎妊娠、卵巢过度刺激等)控制不力、实验室不良事件(如胚胎丢失、传染病携带者生殖细胞操作和储存等不规范)的发生、异常胚胎处置无章可循等;未婚妇女生育力保存、丧偶或者夫妇双方均死亡后其余留胚胎的处置和归属问题、代孕问题和性别选择的伦理争议问题等缺乏相应的法律法规措施;ART运行、实施过程尚缺乏完善的监管体系,更缺乏有力的法律手段,各地受商业利益驱动乱象环生,如地下代孕、赠卵时有发生,影响了我国生殖医学的健康发展。我国ART的QC体系和法律法规亟须完善,以促进我国ART规范、有序、安全、高效运行和发展,保障ART出生子代的健康。

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应用全面质量管理体系运转法降低 辅助生殖技术刺激周期中重度 卵巢过度刺激综合征发生率

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【摘要】 目的 探讨应用全面质量管理体系运转法的 PDCA 循环管理工具是否能降低中重度卵巢过度刺激综合征 (OHSS) 的发生率。方法 2017 年上半年应用 PDCA 循环法实施一系列干预措施, 比较开展 PDCA 前 (2016 年 1~6 月)、后 (2017 年 1~6 月) 辅助生殖技术 (ART) 刺激周期患者的临床资料。结果 患者平均年龄、体质量指数 (BMI)、基础卵泡刺激素 (FSH)、基础促黄体生成素 (LH)、基础雌二醇 (E_2)、平均促性腺激素 (Gn) 使用时间、Gn 用量在 PDCA 开展前、后差异均无统计学意义。开展 PDCA 后中重度 OHSS 患者的血抗苗勒管激素 (AMH)、基础窦卵泡数、人绒毛膜促性腺激素 (hCG) 注射日血 E_2 水平明显高于 PDCA 前 ($P=0.00$ 、 $P=0.00$ 、 $P=0.03$)。PDCA 后中重度 OHSS 发生率 (1.2%)、新鲜周期胚胎移植率 (54.5%)、迟发型 OHSS 发生率 (54.5%) 较 PDCA 前明显下降 (2.1%、86.0%、82.5%, $P=0.01$ 、 $P=0.00$ 、 $P=0.01$)。PDCA 后氯米芬 (CC) 温和刺激促排卵方案比率 (45.5%)、全部胚胎冷冻率 (45.5%) 明显增加 (17.5%、14.0%, $P=0.01$ 、 $P=0.00$)。达菲林触发排卵比率、正常受精率、卵裂率较 PDCA 前无明显增加。结论 应用 PDCA 循环, 实施一系列防止中重度 OHSS 发生的措施, 可降低 ART 刺激周期中重度 OHSS 发生率。

【关键词】 辅助生育技术 (ART); 卵巢过度刺激综合征 (OHSS); PDCA 循环; 促排卵; 并发症

Application of total quality management system methods to reduce the incidence of moderate and severe ovarian hyperstimulation syndrome in assisted reproductive technology cycles Huang Jie, Cai Lingbo,

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【Abstract】 Objective To explore whether the application of PDCA cycle management tools can reduce the incidence of moderate and severe ovarian hyperstimulation syndrome (OHSS). **Methods** Based on PDCA cycle management tools, some interventions were performed in patients in assisted reproductive technology (ART) stimulation cycles. The data of the patients were compared before (from January to June 2016) and after (from January to June 2017) PDCA. **Results** In both groups before and after PDCA cycle, there were no significant differences in patients' age, body mass index (BMI), the level of basal follicle stimulating hormone (FSH), luteinizing hormone (LH) and estradiol (E_2), average duration of gonadotropin (Gn) used, Gn consumption. After PDCA cycle, the incidence of moderate and severe OHSS (1.2%), the embryo transplantation rate (54.5%), the late-onset OHSS rate (54.5%) were significantly reduced compared with before PDCA cycle (2.1%, 86.0%, 82.5%; $P=0.01$, $P=0.00$, $P=0.01$). After PDCA cycle, the rates of clomiphene citrate (CC) mild-stimulation protocol (45.5%) and all embryos-freezing cycles (45.5%) were significantly increased (17.5%, 14.0%; $P=0.01$, $P=0.00$). There were no significant differences in the incidence of severe OHSS, the Diphereline trigger rate, 2 pronucleus (PN) fertilization rate, and cleavage rate. **Conclusion** With using PDCA management cycle, a series of interventions for prevention OHSS had been done to reduce the incidence of moderate and severe OHSS rates in ART cycles.

【Key words】 Assisted reproductive technology (ART); Ovarian hyperstimulation syndrome (OHSS); PDCA cycle; Ovarian stimulation; Complication

控制移植胚胎数目策略在降低北京市体外受精 - 胚胎移植多胎妊娠率中的应用及效果分析

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【摘要】 目的 探讨控制体外受精 - 胚胎移植 (IVF-ET) 移植胚胎数目对控制医源性多胎发生率行业管理的实施效果。方法 比较北京市人类辅助生殖质量控制和改进中心 (辅助生殖质控中心) 提出北京市 IVF-ET 移植胚胎数不多于 2 枚的策略前、后, 北京市各生殖中心移植胚胎数和多胎妊娠率变化。结果 北京市生殖中心新鲜和解冻移植周期的平均移植胚胎数目逐年下降, 分别由 2013 年的 2.02 枚和 2.04 枚, 下降至 2015 年的 1.91 枚和 1.80 枚。2014 年、2015 年新鲜周期临床妊娠率为 45.4% 和 44.5%, 解冻周期临床妊娠率为 47.2% 和 46.2%, 均分别显著高于 2013 年的新鲜周期临床妊娠率 (43.2%, $P=0.000$, $P=0.025$)、解冻周期临床妊娠率 (43.4%, P 均 = 0.000)。2014 年新鲜周期的活产率 (36.6%) 显著高于 2013 年 (35.0%, $P=0.004$), 2015 年新鲜周期活产率与 2013 年比差异无统计学意义 ($P>0.05$)。2014 年和 2015 年解冻周期的活产率 (37.4%, 36.5%) 均显著高于 2013 年 (34.3%, $P=0.000$, $P=0.001$)。2015 年新鲜周期和解冻周期的多胎妊娠率分别为 28.0% 和 23.5%, 显著低于 2013 年的 31.3% 和 25.7% ($P=0.000$, $P=0.016$)。结论 辅助生殖质量控制中心提出的建议每移植周期胚胎数目不超过 2 个, 既保证了临床妊娠率和活产率不下降, 同时对控制本地区 IVF-ET 多胎妊娠率效果显著, 可为行政决策部门进行行业管理提供参考依据。

【关键词】 质量控制; 体外受精 - 胚胎移植 (IVF-ET); 移植胚胎数目; 多胎妊娠率

Effect of controlled transferred embryo numbers on reducing *in vitro* fertilization-embryo transfer multiple pregnancy rate in Beijing

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【Abstract】 Objective To evaluate the effect of management of the number of transferred embryos guided by Beijing Human Assisted Reproductive Technology Center on controlling the multiple pregnancy rate after *in vitro* fertilization-embryo transfer (IVF-ET) in Beijing. **Methods** The changes of the number of transferred embryos and the multiple pregnancy rate were compared before and after the control of 2 embryos transfer strategy. **Results** The data showed that both the number of fresh and frozen-thawed embryos transferred were decreased year by year. Number of fresh embryos transferred was 2.02 in 2013 and 1.91 in 2015, while number of frozen-thawed embryos transferred was 2.02 in 2013 and 1.80 in 2015. Clinical pregnancy rate of fresh transfer cycle was 45.4% and 44.5% in 2014 and 2015, respectively, which was higher than that in 2013 (43.2%, $P=0.000$, $P=0.025$). Clinical pregnancy rate of frozen-thawed transfer cycle was 47.2% and 46.2% in 2014 and 2015, respectively, which was higher than that in 2013 (43.4%, $P=0.000$, $P=0.000$). Live birth rate of fresh transfer cycle in 2014 (36.6%) was significantly higher than that in 2013 (35.0%, $P=0.004$), while there was no significant difference between 2013 and 2015 ($P>0.05$). Live birth rate of frozen-thawed transfer cycle was significantly higher in 2014 and 2015 (37.4%, 36.5%) than in 2013 (34.3%, $P=0.000$, $P=0.001$). The multiple pregnancy rates of fresh and frozen-thawed embryo transfer in 2015 were 28.0% and 23.5%, which were significantly lower than those in 2013 (31.3%, 25.7%; $P=0.000$, $P=0.016$), respectively. **Conclusion** The strategies proposed by Beijing Human Assisted Reproductive Technology Center to control the number of IVF-ET embryos were well implemented. It not only ensures that clinical pregnancy rate and live birth rate do not decline, but also has a significant effect on the control of IVF-ET multiple pregnancy rate, which can provide the reference for the administrative decision-making department for the next step of the industrial management.

【Key words】 Quality control; *In vitro* fertilization and embryo transfer (IVF-ET); Number of embryo transfer; Multiple pregnancy rates

辅助生殖患者就诊流程应用软件的应用探讨

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【摘要】目的 探讨设计开发应用软件 (APP) 来帮助辅助生殖助孕治疗周期中的患者个性化管理就诊流程的可行性。**方法** 利用智能手机终端根据患者就诊流程设计开发就诊流程管理软件, 在患者端帮助患者自主管理病程, 在医护端针对患者就诊流程中的问题进行解答, 完成患者就诊全流程管理。**结果** APP 于 2016 年 12 月 1 日上线, 截至 2017 年 9 月 30 日共上线患者 17 012 人, 标记就诊日期 107 010 次, 在此期间我中心共进入辅助生殖助孕治疗周期 [体外受精 - 胚胎移植 (IVF-ET) 包括新鲜胚胎与解冻胚胎] 患者 22 828 人次, 患者扫码率为 74.5%, 在扫码患者中就诊日期标记率为 94.7%。发起提问 12 920 条, 平均每日提问 42 条, 其中 12 112 条为智能问题库推送回复, 占总回复问题的 81.9%, 2 684 条为人工平台回复问题, 占总回复问题的 18.1%。**结论** IVF-ET 患者就诊流程 APP 使用率超过 75%, 使患者与医护人员的互动通道顺畅, 提高了患者满意度。

【关键词】 就诊流程; 应用软件 (APP); 辅助生殖技术; 病程管理

Implementation of treatment process management application software in assisted reproductive technology patients

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【Abstract】 Objective To explore whether the application software (APP) can help patients manage individual process in the period of assisted reproductive technology (ART) treatment. **Methods** The smart phone as the terminal was used to design and develop the process management APP according to the patient's visiting process, which helped the patients manage treatment process and answered the questions that arise in the different steps of medical care process. **Results** From the launching of the APP on Dec. 1st 2016 to Sept. 30th 2017, 17 012 patients registered, and marked visiting date 107 010 times. Among the 22 828 patients being treated in this period, the roll-in rate was 74.5%, the activity rate of roll-in patient was 94.7%. Totally 12 920 questions were asked, of which 12 112 were replied by auto reply from intelligent question bank, while 2 684 were from artificial platform, the ratio was 81.9% and 18.1%, respectively. **Conclusion** There was more than 75% ART patients using APP, which is a smooth interactive channel between patients and medical care and can enhance satisfaction of patients.

【Key words】 Treatment process; Application software (APP); Assisted reproductive technology (ART); Treatment process management

辅助生殖专科护士培养模式及实践效果分析

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【摘要】目的 探讨辅助生殖专科护士临床培训模式,以进一步提高专科护士胜任能力。**方法** 根据《浙江省专科护士培训方案》,结合辅助生殖护理专科特点,制定培训形式、培训内容和考核方法。第一期辅助生殖专科护士培训共招收 26 名学员,进行为期 4 个月全脱产系统培训,其中理论授课 1 个月,临床实践技能培训 3 个月。培训结束后,进行理论与实践考核评价。**结果** 26 名学员通过培训,理论、临床实践技能及专家答辩等各项考核均合格,培训前、后所有学员专科理论成绩明显提高,平均成绩分别为 (37.48 ± 12.20) 分、 (87.36 ± 3.58) 分,差异具有统计学意义 ($P=0.000$); 具备英文文献检索能力由培训前的 15.4% 提高至 69.2%,差异具有统计学意义 ($P=0.000$); 培训结束后,综述、开题报告和个案护理专家答辩成绩平均 (90.56 ± 2.16) 分。**结论** 以专科理论、专科技能、科研能力为核心的临床培养模式,可全面提升辅助生殖专科护士核心胜任能力。

【关键词】 辅助生殖技术 (ART); 专科护士; 核心能力

Analysis of clinical training model for specialist nurses of assisted reproductive technology and the clinical practice effect

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【Abstract】 Objective To develop clinical training model for specialist nurses of assisted reproductive technology (ART), in order to further improve their professional competence. **Methods** To develop training programs and assessment methods, according to the Training Protocol for Zhejiang Specialist Nurses and characteristics of assisted reproductive nursing specialty, 26 trainees were enrolled for 4-month period of phase I training, which included 1 month of theoretical teaching and 3 months of clinical practice training. Theoretical and clinical technique assessments were performed after the training. **Results** All 26 trainees passed the theoretical, clinical practice and expert assessments after the training, with statistically significant improvement of theoretical score from the average of 37.48 ± 12.20 to 87.36 ± 3.58 ($P=0.000$). They all acquired reference searching ability, with statistically significant improvement of the score from 15.4% to 69.2% ($P=0.000$). The average score of reference reviewing, thesis proposal and thesis defense with case care specialists was 90.56 ± 2.16 after the training. **Conclusion** The training model, which focused on specialized theory, professional clinical technique and scientific research ability, significantly improved overall professional competence of specialist nurses of ART.

【Key words】 Assisted reproductive technology (ART); Clinical nurse specialist; Core competence

国际人类辅助生殖技术监督与质量管理模式

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【摘要】 随着辅助生殖技术 (ART) 在我国的迅猛发展, 其安全性、有效性以及涉及的伦理、法律问题日益引人关注。全球 ART 的监管主要有 3 条路径: 通过政府建立权威的归口管理机构, 制定法律法规监管路径; 非官方的行业协会自身监管路径; ART 中心通过不断改进质量管理体系, 完善自身质量管理的路径。对 ART 的系统管理, 可确保 ART 中心的良性发展, 从而保障公众和不孕夫妇的利益。本文对国际上各层级 ART 的监管体系的形成和特点进行分析, 以供参考。

【关键词】 辅助生殖技术 (ART); 质量控制; 监管

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【Abstract】 With the rapid development of assisted reproductive technology (ART) in China, its safety, effectiveness, ethics and laws involved are receiving more and more attention. There are three main paths for the global regulation of ART: the establishment of an authoritative and centralized management institution through the government regulatory path; unofficial industry association's regulatory path; quality management system established by ART Centers. System management of ART ensures the healthy development of the ART Center, and protects the interests of the public and infertile couples. This paper analyzes the formation and characteristics of the international ART's regulatory system for reference.

【Key words】 Assisted reproductive technology (ART); Quality control; Supervision

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辅助生殖技术实验室的质量控制体系

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【摘要】 人类辅助生殖技术 (ART) 实验室是 ART 实施的核心部门。体外受精 - 胚胎移植 (IVF-ET) 是一个复杂的操作过程, 包括多项技术的实施, 其工作质量直接关系到辅助生殖治疗的成败, 因此, 建立完善的质量控制体系、保证 ART 实验室的工作质量尤为重要。ART 实验室的工作质量受到多方面因素的影响, 包括环境、仪器设备、耗材试剂、人员及体外操作等。建立完善的质量控制体系, 对影响实验室工作质量的诸多因素进行控制、监测和改进, 有利于保证实验室工作质量的一致性和稳定性, 有助于问题的及时发现和持续改进, 从而进一步优化临床治疗结局。

【关键词】 辅助生殖技术 (ART); 实验室; 质量控制体系

· 质量控制专栏 ·

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【Abstract】 Human assisted reproductive technology (ART) laboratory is the core department of ART implementation. *In vitro* fertilization-embryo transfer (IVF-ET) is a complex operation process, including the implementation of multiple technologies. The quality of its work is directly related to the success or failure of assisted reproductive treatment. Therefore, it is very important to establish a good quality control system to ensure the quality of ART laboratory work. The quality of ART laboratory is affected by various factors, including environment, equipment, consumables, staffing, *in vitro* operation, and so on. The establishment of a good quality control system for ART laboratory and the control, monitoring and improvement of the factors affecting the quality of laboratory work is conducive to ensuring the consistency and stability of the quality of laboratory work, helping the timely discovery and continuous improvement of problems, so as to further optimize clinical treatment outcomes.

【Key words】 Assisted reproductive technology (ART); Laboratory; Quality control system

胚胎实验室质量控制

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【摘要】 胚胎实验室质量控制是辅助生殖技术中重要的一环。通过质量控制, 生殖中心的胚胎实验室培养体系得以保持稳定的状态。这对于维持生殖中心良好的妊娠率具有至关重要的作用。良好的质量控制包括胚胎实验室仪器设备、培养液耗材、人员质控以及定期质控自查。本文将结合本中心实际情况分别对这四方面进行论述。

【关键词】 胚胎实验室; 胚胎培养; 质量控制

·质量控制专栏·

Quality management of culture systems in *in vitro* fertilization laboratory Fang Cong, Liang Xiaoyan
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【Abstract】 Quality management plays an essential role in assisted reproductive technology (ART), which stabilizes the culture systems in *in vitro* fertilization (IVF) laboratory, and thus maintains satisfactory IVF outcomes. This review focuses on improving the quality management of culture systems in IVF laboratory, including IVF equipment, media, disposables, quality management of laboratory staff and self-inspection.

【Key words】 *In vitro* fertilization laboratory; Embryo culture; Quality management

植入前遗传学诊断及筛查技术的实验室质量控制体系

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【摘要】 近年来,随着分子生物学和辅助生殖技术(ART)的进步,胚胎植入前遗传学诊断(PGD)和胚胎植入前遗传学筛查(PGS)技术以其前所未有的速度在全球快速发展。本文从胚胎活检和遗传学诊断这2个方面,对PGD/PGS的实验室建立、人员培训及操作流程等方面做一综述,并提出了质量控制的具体评价指标。

【关键词】 胚胎植入前遗传学诊断(PGD); 胚胎植入前遗传学筛查(PGS); 质量控制

·质量控制专栏·

Quality management of preimplantation genetic diagnosis and preimplantation genetic screening

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【Abstract】 In recent years, with the development of molecular biology and assisted reproductive technology (ART), preimplantation genetic diagnosis (PGD) and preimplantation genetic screening (PGS) have been improved dramatically in the world. In this review, we summarized the quality management of preimplantation genetic diagnosis and preimplantation genetic screening, such as laboratory establishment, staff training and operation process from the two aspects of embryo biopsy and genetic diagnosis. Moreover, we put forward specific evaluation indicators for quality management.

【Key words】 Preimplantation genetic diagnosis (PGD); Preimplantation genetic screening (PGS); Quality management

辅助生殖技术的安全核查管理与流程

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【摘要】 近年来, 辅助生殖技术 (assisted reproductive technology, ART) 在生殖中心应用日趋广泛, 而与 ART 有关的医疗安全问题也日益凸显。因此有必要建立 ART 安全核查管理制度和操作流程, 以保障 ART 安全, 降低潜在风险, 提高医护服务质量。本文结合本院生殖中心的实践情况, 进行了以下 3 个方面的探索。首先, 建立身份识别制度。在核对证件的同时, 采集不孕夫妇双方的指纹和头像存档。在进行获取配子 (卵子和精子) 前、胚胎移植前和冷冻胚胎复苏周期胚胎移植前均通过指纹系统进行身份验证。其次, 建立医疗档案管理制度, 实现辅助生殖病案的信息化管理。最后, 建立严格的核查制度, 包括检验核对、用药核对、手术安全核查、胚胎实验室安全核查等制度。

【关键词】 辅助生殖技术 (ART); 安全核查; 信息化管理; 查对制度

· 质量控制专栏 ·

Management of safety verification and process of assisted reproductive technology Cai Lingbo,

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【Abstract】 With the increasing application of assisted reproductive technology (ART) in clinical practice, medical safety in ART become more and more prominent. It is necessary to establish a safety verification management system and operational processes for ART, to ensure ART safety, reduce potential risks, and improve the quality of medical services. This paper mainly focuses three aspects. Firstly, identity system needs to be established. The identification of infertile couples is not only verifying their credentials, but also their fingerprints and faces. These information will be verified during ART every step, including before gametes (oocyte and sperm) retrieval, before embryo transfer, and frozen embryo thawing. Secondly, medical file management system is established, realizing informational management. Thirdly, strictly implement checking system is needed, such as check and verify system, medication check system, surgical safety verification system, and laboratory safety verification system.

【Key words】 Assisted reproductive technology (ART); Safety verification system; Information management system; Check system

辅助生殖技术实验室环境和空气质量的控制

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【摘要】体外受精 (IVF) 实验室作为辅助生殖技术 (ART) 的重要组成部分, 被誉为生殖中心的“心脏”, 对 IVF 的结局至关重要。辅助生殖实验室必须建立严格的质量控制与管理体系, 并以提高 ART 活产率和安全性为根本, 以规范科学为标准。实验室环境和空气质量是影响 ART 结局的关键因素之一, 本文主要介绍了影响配子和胚胎发育的实验室环境因素及其控制方法。

【关键词】 辅助生殖技术 (ART); 体外受精 (IVF) 实验室; 环境; 空气质量

· 质量控制专栏 ·

Quality management of environment and air quality in assisted reproductive technology laboratory Luo Jin,

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【Abstract】 *In vitro* fertilization (IVF) laboratory, which is known as the heart of the reproductive medical center, is an important part of assisted reproductive technology (ART) closely related to the IVF outcome. IVF laboratory must establish a strict quality control and management system based on the live birth rate and security and standard by criterion and scientific knowledge. Laboratory environment and air quality is one of the key factors contribute to successful assisted reproduction technique outcomes. This review describes several important factors and management methods of laboratory environment which would affect the development of gametes and embryos.

【Key words】 Assisted reproductive technology (ART); *In vitro* fertilization (IVF) laboratory; Environment; Air quality

取卵手术的手术室护理规范和流程管理

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【摘要】 作为体外受精-胚胎移植 (IVF-ET) 治疗过程中的重要步骤, 取卵术在整个治疗流程中至关重要。取卵手术需要临床医生、胚胎师和护理人员 3 个部门的相互协作, 在取卵过程中任何一个环节疏忽都有可能对卵子产生影响, 甚至造成患者治疗周期的失败。护理工作取卵手术中发挥着重要的作用, 也是 IVF-ET 治疗过程质量管理的重要一环。完善各项取卵护理制度、流程精细化管理和操作规范化, 是提高护理质量、保证医疗安全的重要保障。

【关键词】 取卵手术; 流程管理; 重要流程; 护理管理

· 质量控制专栏 ·

The process and standardized management of oocyte retrieval operation in *in vitro* fertilization operating room

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【Abstract】 Oocyte retrieval is a vital step during the whole process of *in vitro* fertilization and embryo transfer (IVF-ET). It requires close cooperation of three departments including clinical doctors, embryologists and nurses. In the process of egg retrieval, adequate preparation is important to ensure the operation performed smoothly. Any negligence in the process can affect the quality of oocytes and the results of IVF cycle, and may lead to failure of IVF-ET treatment. Nursing plays an important role in oocyte retrieval and is an important part of quality management in IVF-ET process. To ensure the quality of nursing and the safety of IVF-ET treatment, improve nursing system, delicacy management and standardize operation flow in the process of oocyte retrieval are needed.

【Key words】 Oocyte retrieval operation; Process management; Key process; Nursing management

医疗助理在辅助生殖专家门诊诊间患者管理中的作用

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【摘要】 近年随着不孕不育人群的增加及医学模式的转变,传统的门诊服务模式受到了严重的冲击。为了不断完善服务模式、持续改进服务质量,为患者提供更加优质的医疗服务,本中心创新性地设立了新的工作岗位,即门诊医疗助理岗。该岗位由护士担任,用于维持门诊就诊秩序,保证一对一就诊模式,诊前对检验结果进行整理归类及安排常规检查,就诊结束后开立相关医嘱、进行宣传教育及交代注意事项,帮助患者预约下次门诊就诊时间等。门诊医疗助理岗的设立不仅帮助患者节约了就诊时间,还大大提高了患者的满意度。

【关键词】 医疗助理; 辅助生殖专家门诊; 诊间患者管理

· 质量控制专栏 ·

Role of medical assistants in patient management of assisted reproduction specialist clinic Ding Xiaoqin,

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【Abstract】 In recent years, with the increase of infertility population and medical model change, the traditional outpatient service model has been impacted a lot. In order to continuously improve the service model and service quality, and provide better medical services for patients, our center has set up a new job of innovation-outpatient medical assistant. The job is held by the nurse, used to maintain the outpatient treatment order, to ensure one-on-one treatment service, to consolidate the examination result before the diagnosis and arrange routine examination, to give advice after the end of the relevant medical service, to educate the patient about accountable matters and to help patients reserve the next treatment time. Outpatient medical assistant job setting up not only helps patients save the treatment time, but also greatly improves patient satisfaction.

【Key words】 Medical assistants; Assisted reproduction specialist clinic; Patient management

植入前遗传学诊断技术产生的社会伦理问题及其监管对策

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【摘要】 体外受精 (IVF) 技术与分子生物学和现代遗传学相结合促成的植入前遗传学诊断 (PGD)/植入前遗传学筛查 (PGS) 技术为有效阻断遗传病传播、从源头上实现优生开辟了广阔的前景。伴随着 PGD/PGS 技术的日渐成熟、安全、有效, 其带来的各种伦理质疑纷至沓来。本文结合目前 PGD/PGS 的研究进展, 阐述其应用前景及该技术带来的社会伦理问题, 总结目前各国解决这些问题实施的相关举措, 旨在为我国制定相关伦理指南和法律规范提供参考, 推动我国相关立法进程。

【关键词】 植入前遗传学诊断 (PGD); 设计婴儿; 社会伦理; 性别选择

基金项目: 国家社科基金项目 (13BFX128); 安徽省教育厅高校人文社会科学研究重大项目 (SK2017ZD13)

Social ethical issues and countermeasures for preimplantation genetic diagnosis Cao Yunxia, Hao Yan, Yang Fang

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【Abstract】 Preimplantation genetic diagnosis (PGD)/preimplantation genetic screening (PGS) technology, which is *in vitro* fertilization (IVF) technology combined with molecular biology and modern genetics, has opened up a broad prospect for effectively blocking the spread of genetic diseases and achieving eugenic. With the development of PGD/PGS, the “double-edged sword” effect of PGD/PGS has become increasingly prominent. Based on the current research progress of PGD/PGS, this paper expounds its application prospect and social ethics problems caused by the technology, and summarizes relevant measures taken by various countries to solve those problems, in order to provide references for the formulation of relevant ethics guidelines and legal norms and promote the process of relevant legislation in China.

【Key words】 Preimplantation genetic diagnosis (PGD); Designer babies; Social ethics; Gender selection

Fund program: National Social Science Foundation (13BFX128); Major Project of Humanities & Social Sciences Foundation of Anhui Provincial Department of Education (SK2017ZD13)

选择性卵子冷冻若干伦理问题研究

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【摘要】 卵子玻璃化冷冻保存作为女性生育力保存技术的新突破, 一定程度上拓宽了女性的生育选择空间, 也为因社会因素推迟生育的健康女性提供了生殖保险。然而, 这种选择性卵子冷冻的应用也产生了各种伦理难题, 焦点集中在该技术的适应证及其适用对象。选择性冷冻的伦理评估应综合考量冷冻的安全性、有效性、经济性和补偿性等核心议题。考虑到选择性冷冻的伦理争议较大, 国家和生殖医学中心应当采取一系列伦理和管理措施, 努力因势利导, 将其引向规范化的临床实践。

【关键词】 选择性卵子冷冻; 非医疗原因; 推迟生育; 伦理评估

基金项目: 国家社科基金项目(13BFX128); 安徽省教育厅高校人文社会科学研究重大项目(SK2017ZD13)

· 质量控制专栏 ·

Ethical evaluation on elective oocyte cryopreservation Yang Fang, Cao Yunxia

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【Abstract】 The relatively new technology of oocyte and ovarian tissue freezing may represent a major breakthrough of fertility preservation and expand women's reproductive options of a future pregnancy, which encourages healthy women to seek elective oocyte cryopreservation as an insurance against age-related fertility caused by postponing childbearing for non-medical reasons. However, the application of this procedure results in all sorts of ethico-legal issues and bioethical concerns. It is widely discussed the key issues in the debates around supporting and challenging elective oocyte cryopreservation, including moral acceptability, reproductive autonomy, medicalization of reproduction, medical implications, safety, efficacy, cost-effectiveness of the procedure, potential benefits and harms to mother and offspring, and other issues. In light of the controversial nature of elective oocyte cryopreservation, a series of ethical countermeasures should be taken to turn it into a procedure that is conducive to best clinical and ethical practices.

【Key words】 Elective oocyte cryopreservation; Nonmedical reasons; Delaying childbirth; Ethical evaluation

Fund program: National Humanities & Social Science Foundation (13BFX128); Major Project of Humanities & Social Sciences Foundation of Anhui Provincial Department of Education (SK2017ZD13)

腹腔镜手术治疗子宫内膜异位症相关不孕症的研究进展

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【摘要】 子宫内膜异位症 (EMS) 在患有不孕症的女性中发病率高, 与不孕症关系密切, 但是其间的具体作用机制尚不明确。研究显示, EMS 在卵巢排卵、卵子质量、精卵结合、胚胎质量及种植、子宫内膜容受性等方面均有不利影响, 且 EMS 的产科并发症发生率也高于无 EMS 的患者。本文就 EMS 对妊娠不同环节的影响、不同类型 EMS 手术干预对妊娠的影响以及腹腔镜手术治疗时的侧重点进行综述, 以期为 EMS 的临床治疗提供参考。

【关键词】 子宫内膜异位症 (EMS); 不孕症; 不同类型; 腹腔镜

基金项目: 国家自然科学基金项目 (81671438)

Advances in the treatment of infertility associated with endometriosis by laparoscopy Yang Chunxia,
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【Abstract】 The incidence of endometriosis (EMS) in infertile women is high, but the specific mechanism of infertility due to EMS is not clear. Studies suggested that EMS had a negative impact on ovulation, egg quality, sperm-oocyte binding, embryo quality and plantation, and endometrial receptivity. Nevertheless, the incidence of obstetric complications is also higher in patients with EMS than those who do not have EMS. This article reviews the effects of EMS and different surgery types on the process of pregnancy, and different focus of different types of EMS surgery, in order to provide the reference for clinical treatment.

【Key words】 Endometriosis (EMS); Infertility; Different types; Laparoscopic surgery

Fund program: National Natural Science Foundation of China (81671438)

腹腔镜手术治疗子宫内膜异位症相关不孕症的研究进展

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具体作用机制尚不明确。研究显示, EMS 在卵巢排卵、卵子质量、精卵结合、胚胎质量及种植、子宫
内膜容受性等方面均有不利影响, 且 EMS 的产科并发症发生率也高于无 EMS 的患者。本文就 EMS 对妊
娠不同环节的影响、不同类型 EMS 手术干预对妊娠的影响以及腹腔镜手术治疗时的侧重点进行综述, 以
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妊娠滋养细胞疾病史的不孕患者体外受精 / 卵胞质内单精子显微注射结局分析

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【摘要】 目的 探讨既往患妊娠滋养细胞疾病 (GTD) 对不孕患者行体外受精 / 卵胞质内单精子显微注射 (IVF/ICSI) 治疗的临床结局影响。方法 回顾性分析 43 名有 GTD 史的继发不孕患者 (研究组) 的临床资料, 并根据年龄、不孕年限、不孕原因及促排卵方案 1 : 2 匹配 86 名既往无 GTD 史的继发不孕患者作为对照组, 比较两组间的 IVF/ICSI 临床结局。研究组再根据既往 GTD 的治疗方法分为单纯清宫组 (A 亚组, $n=32$) 和清宫联合化疗组 (B 亚组, $n=11$)。结果 研究组与对照组在获卵数、正常受精数、异常受精数及可用胚胎数上组间差异均无统计学意义 ($P>0.05$)。研究组移植日内膜厚度 [(9.2 ± 2.1) mm] 明显低于对照组 [(10.3 ± 2.0) mm, $P=0.002$], 移植后的生化妊娠率 (31.7%) 和继续妊娠率 (18.3%) 都显著低于对照组 (47.5%, 37.6%), 差异有统计学意义 ($P=0.007$)。但研究组的分娩孕周及新生儿体质量与对照组差异无统计学意义。A 亚组和 B 亚组的可用胚胎数及继续妊娠率组间差异均无统计学意义 ($P>0.05$)。结论 既往 GTD 史的继发不孕患者应用 IVF/ICSI 治疗的过程中, 可获得与无 GTD 史的患者相似的正常受精数及可用胚胎数。但由于移植日内膜厚度更薄, 故移植后的妊娠率低于无 GTD 史的患者。

【关键词】 妊娠滋养细胞疾病 (GTD); 继发不孕症; 体外受精 / 卵胞质内单精子显微注射 (IVF/ICSI); 清宫术; 化疗

Clinical outcomes of *in vitro* fertilization/intracytoplasmic sperm injection treatment in infertility women with a history of gestational trophoblastic disease Shen Xi, Chen Qiuju, Kuang Yanping

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【Abstract】 Objective To explore the effect of a history of gestational trophoblastic disease (GTD) on the clinical outcomes of *in vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI) treatments in infertility women. **Methods** This retrospective study included 43 patients with a history of GTD as study group and 86 patients 1 : 2 matched by age, duration of infertility, cause of infertility and same ovarian stimulation protocol as control group. The patients in study group were divided into subgroup A (uterine curettage group, $n=32$) and subgroup B (uterine curettage combined with chemotherapy group, $n=11$) according to the therapy received. The characteristics of ovarian stimulation and outcomes of embryos and pregnancy were compared. **Results** Study group had similar retrieved oocytes, normal fertilized oocytes, abnormal fertilized oocytes and viable embryos compared with control group ($P>0.05$). However, there was a significant difference in thickness of the endometrium between study group [9.2 ± 2.1 mm] and control group [10.3 ± 2.0 mm, $P=0.002$]. The biochemical pregnancy rate and ongoing pregnancy rate in study group (31.7%, 18.3%) were significantly lower than those in control group (47.5%, 37.6%, $P=0.007$). The birth outcomes were not different between the two groups. And there was no significant difference between subgroups A and B. **Conclusion** Patients with a history of GTD can present with a similar number of normal fertilized oocytes and number of viable embryos. However, patients with a history of GTD may have a thinner endometrium, thus resulting in lower ongoing pregnancy rate.

【Key words】 Gestational trophoblastic disease (GTD); Secondary infertility; *In vitro* fertilization/intracytoplasmic sperm injection (IVF/ICSI); Uterine curettage treatment; Chemotherapy

人类白细胞抗原基因型的胚胎植入前遗传学诊断

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【摘要】 目的 建立人类白细胞抗原 (human leukocyte antigen, HLA) 基因配型, 为开展 HLA 配型的胚胎植入前遗传学诊断 (preimplantation genetic diagnosis, PGD) 联合或不联合单基因病的临床工作提供技术支持。方法 采用多重置换扩增 (multiple displacement amplification, MDA) 的方法扩增 3~5 个滋养层细胞的全基因组, 并用多重聚合酶链式反应 (PCR) 方法扩增多个短串联重复多态性 (polymorphic short tandem repeat, STR) 位点, 通过毛细管电泳技术验证 STR 位点的特异性。结果 微量细胞全基因组的扩增成功率为 93.75%, 筛选了 *HLA* 基因的 5 个杂合度高、特异性强的 STR 位点, 等位基因脱扣 (allele drop-out, ADO) 率为 10.34%。结论 微量细胞 MDA 结合多重 PCR 的方法可以同时检测 *HLA-A*、*HLA-B*、*DRA*、*DQB* 位点, 扩增成功率高, ADO 率低, 可以有效地筛选出相匹配的胚胎, 为同胞患儿提供造血干细胞来源具有可行性。

【关键词】 胚胎植入前遗传学诊断 (PGD); 人类白细胞抗原 (HLA); 多重聚合酶链式反应 (PCR)

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· 临床研究 ·

Research of preimplantation genetic diagnosis of human leukocyte antigen genotype Du Shengrong, Zeng Guoying, Sun Yan, Lin Yunhong, Lin Dianliang, Chen Qingfen, Kang Yuefan
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【Abstract】 Objective To provide technical support in preimplantation genetic diagnosis (PGD) of human leukocyte antigen (HLA) matching, associating with or without genetic disease, to establish a multiplex polymerase chain reaction (PCR) for HLA matching in few cells. **Methods** The whole genome of 3–5 trophoblast cells was firstly amplified with a method of multiple displacement amplification (MDA). By using the whole genome as template, the polymorphic short tandem repeat (STR) loci were then amplified with a method of multiplex PCR. The specificity of STR locus was identified with capillary electrophoresis. **Results** By using this approach, the whole genome was amplified from the few cells, in a rate of 93.75%, and 5 highly heterozygous polymorphic STR loci were screened. The rate of allele drop-out (ADO) was 10.34%. **Conclusion** Combining the method of MDA in few cells with multiplex PCR, we can simultaneously detect HLA-A, HLA-B, on DRA, DQB loci, and effectively screen the matching embryos to provide child-patients with hematopoietic stem cells in a high amplification success rate and a low ADO rate.

【Key words】 Preimplantation genetic diagnosis (PGD); Human leukocyte antigen (HLA); Mutiplex polymerase chain reaction (PCR)

Fund program: Key Project of Fujian Province Family Planning (Fujian health science and education 2012149); the Scientific Research Project of Health Family Planning in Fujian Province (2017-1-17); Research of Fujian Provincial Maternity and Children's Hospital (14-02)

莱克多巴胺对人卵巢颗粒细胞类固醇激素合成急性调节蛋白表达的影响

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【摘要】目的 探讨 β_2 肾上腺素受体 (adrenergic receptor, AR) 激动剂莱克多巴胺 (ractopamine, RAC) 对人卵巢颗粒细胞类固醇激素合成的效应。方法 在人卵巢颗粒细胞体外培养系统中, 添加高 (50 $\mu\text{mol/L}$)、中 (5 $\mu\text{mol/L}$)、低 (0.5 $\mu\text{mol/L}$) 3 种剂量的 RAC, 并设置空白对照 (对照组)、50 $\mu\text{mol/L}$ 克伦特罗 (clenbuterol, CLB) 和 50 $\mu\text{mol/L}$ 普萘洛尔组, 在 0 h、4 h、12 h、24 h 和 48 h 回收细胞, 采用实时荧光定量 PCR 和 Western blotting 检测颗粒细胞类固醇激素合成急性调节蛋白 (steroidogenic acute regulatory protein, StAR) mRNA 和蛋白表达水平的变化。结果 各实验组颗粒细胞 StAR mRNA 的表达与其蛋白表达的变化趋势基本一致。对照组颗粒细胞各时间点 StAR 的表达水平差异无统计学意义 ($P>0.05$)。CLB 和 RAC 可升高 StAR 表达, 普萘洛尔可抑制其表达。与 0 h 相比, StAR 的表达水平在 RAC 作用后 4 h 达到高峰 ($P=0.000$); 12 h 后, StAR 的表达从峰值急剧下降 ($P=0.003$); 24 h 后, 基本恢复至基础水平 ($P>0.05$)。不同剂量 RAC 与颗粒细胞共培养 4 h 后, StAR 表达水平从高到低的顺序为: RAC 低剂量组 > RAC 中剂组 > RAC 高剂量组, 组间差异有统计学意义 ($P=0.000$)。结论 RAC 可升高颗粒细胞 StAR 的表达水平, 影响卵巢类固醇激素合成功能, 其后果可能引起女性生殖内分泌紊乱。

【关键词】 莱克多巴胺 (RAC); 卵巢颗粒细胞; 类固醇激素合成急性调节蛋白 (StAR)

基金项目: 广州市科技计划项目 (201300000114)

Steroidogenic acute regulatory protein expression in human granulosa cells exposed to ractopamine *in vitro*

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【Abstract】 Objective To investigate the effects of ractopamine (RAC) on the expression of steroidogenic acute regulatory protein (StAR) in granulosa cells, aiming to illustrate the possible effects of RAC on steroidogenesis of the ovary. **Methods** Human granulosa cells were cultured *in vitro* with the additions of 0 $\mu\text{mol/L}$ RAC (control group), 50 $\mu\text{mol/L}$ RAC, 5 $\mu\text{mol/L}$ RAC, 0.5 $\mu\text{mol/L}$ RAC, 50 $\mu\text{mol/L}$ clenbuterol (CLB) and 50 $\mu\text{mol/L}$ propranolol, respectively. After treatment, granulosa cells were harvested at 0 h, 4 h, 12 h, 24 h and 48 h. Protein and mRNA expressions of StAR were measured by Western blotting and real-time RT-PCR, respectively. **Results** After exposed to RAC, the changing tendency of StAR in mRNA level was similar to its protein level. StAR remained low level under control condition. RAC and CLB increased StAR expressions, and propranolol decreased its expression. StAR reached a peak after exposed to RAC for 4 h ($P=0.000$), and underwent a sharp decline after 12 h treatment ($P=0.003$). Thereafter, StAR restored to the basal level at 24 h ($P>0.05$). After cocultured with RAC for 4 h, 0.5 $\mu\text{mol/L}$ RAC significantly increased StAR expression ($P=0.000$). The expression of StAR in 5 $\mu\text{mol/L}$ RAC group was intermediate to 0.5 $\mu\text{mol/L}$ RAC group and 50 $\mu\text{mol/L}$ RAC group. **Conclusion** RAC increased the expression of StAR in granulosa cells, which may enhance steroidogenesis of the ovary and result in the disturbance of steroid hormone homeostasis.

【Key words】 Ractopamine (RAC); Granulosa cells; Steroidogenic acute regulatory protein (StAR)

Fund program: Science and Technology Planning Project of Guangzhou City (201300000114)

不同受精方式早期自然流产物染色体异常分析

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【摘要】目的 探讨不同受精方式对临床早期自然流产组织的染色体异常分布的影响。方法 回顾性分析 102 例早期流产患者的临床资料, 应用微阵列比较基因组杂交技术 (array-based comparative genomic hybridization, aCGH) 比较体外受精 (IVF) 组 (35 例)、卵胞质内单精子注射 (ICSI) 组 (31 例)、对照组 (自然妊娠及夫精人工授精组, 36 例) 流产组织染色体异常率及拷贝数变异 (copy number variants, CNVs)。结果 流产组织染色体异常率 3 组间比较差异无显著统计学意义, 其中三倍体最常见, 其次为微重复/微缺失、单体等。IVF/ICSI 微刺激促排卵患者流产组织核型异常比例最高, 随着流产次数增加, 正常核型胚胎比例增加。共检测出 20 个 CNVs, 9 个 CNVs 为基因组微重复, 11 个 CNVs 为基因组微缺失。**结论** 不同受精方式不影响其自然流产妊娠物染色体异常率及异常分布, 有意义的 CNVs 及其包含的流产相关候选基因将为进一步揭示自然流产原因提供研究方向。

【关键词】微阵列比较基因组杂交 (aCGH); 流产; 妊娠物; 辅助生殖技术 (ART); 拷贝数变异 (CNVs)

Detection for chromosomal aberrations in early spontaneous miscarriages following different fertilization methods Zhang Ting, Hong Yan, Shen Lin, Sun Yun, Yao Ning

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【Abstract】 Objective To investigate the effects of different fertilization methods on chromosomal abnormalities in early clinical spontaneous abortion. **Methods** A cohort study was performed on 102 patients with first trimester miscarriages. Patients were grouped by type of conception: conventional *in vitro* fertilization group (IVF group) ($n=35$), intracytoplasmic sperm injection group (ICSI group) ($n=31$), and control group [natural conception or intrauterine insemination (IUI)] ($n=36$). Array-based comparative genomic hybridization (aCGH) was used for the product of conception (POC) analysis. Copy number variants (CNVs) were compared with those present in the Database of Genomic Variants. **Results** There was no statistic difference in the abnormality rate between these three groups. Trisomy constitutes most of the abnormalities, followed by micro duplications/deletions, monosomy, et al. The abnormality rate is significantly higher in mild stimuli group. The frequency of normal embryonic karyotype increased as the number of miscarriages increased. Twenty CNVs were identified, 9 CNVs were submicroscopic genomic gains and 11 were losses. **Conclusion** Different fertilization methods do not affect the chromosomal abnormality rate and abnormal distribution of pregnancy in spontaneous abortion. The meaningful CNVs and the abortion-related candidate genes involved will provide a research direction for further revealing the causes of spontaneous abortion.

【Key words】 Array comparative genomic hybridization (aCGH); Miscarriages; Product of conception; Assisted reproductive technology (ART); Copy number variants (CNVs)

C 型利钠尿肽在卵细胞双相体外成熟技术中的应用

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【摘要】 卵细胞体外成熟(IVM)技术是指将未成熟的卵丘-卵细胞复合体(COCs)从窦卵泡中取出后,在体外促进卵细胞发育成熟的一种辅助生殖技术。自 1991 年 IVM 技术首次应用于人类以来,其发展较为缓慢。近年来,该技术逐渐受到人们重视,并获得了一定的发展。在卵细胞发育过程中,C 型利尿钠肽(CNP)能够使卵细胞停滞于减数分裂生发泡(GV)期。利用这个特点,逐渐形成基于 CNP 的卵细胞双相 IVM 系统。该技术在多个物种的应用获得了极大的成功。近来,在人类也证实该系统能够大幅提高人类卵细胞 IVM 的获卵率,以及所获卵的发育潜能。本文将论述 CNP 的作用原理,以及卵细胞双相 IVM 技术研究进展。

【关键词】 体外成熟(IVM); C 型利尿钠肽(CNP); 利尿钠肽受体 B

Application of C-type natriuretic peptide in biphasic *in vitro* maturation system Li Hemei, Zhao Yiqing
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【Abstract】 The definition of oocytes *in vitro* maturation (IVM) is that the maturation *in vitro* of immature cumulus-oocyte complexes (COCs) collected from antral follicles. IVM was firstly used in human in 1991, but it developed very slowly. Now researchers pay more and more attention to IVM. C-type natriuretic peptide (CNP) can sustain the arrest of oocytes at germinal vesicle (GV) stage. According to this, biphasic IVM system based on CNP is established, and it works effectively in multi-species. Recently, it was proved that this kind of IVM system can improve human oocytes maturation rate and the developmental competence of mature oocytes. This article summarizes the action principle of CNP and the research advances of biphasic IVM system.

【Key words】 *In vitro* maturation (IVM); C-type natriuretic peptide (CNP); Natriuretic peptide receptor B (NPRB or NPR2)

多囊卵巢综合征健康教育依从性影响因素及改善措施

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【摘要】 多囊卵巢综合征 (polycystic ovary syndrome, PCOS) 是育龄期女性较常见的生殖内分泌疾病, 临床表现为月经紊乱、多毛痤疮、不孕、肥胖等, 近年来发病率呈上升趋势。研究表明健康教育可以促进 PCOS 患者形成良好的生活方式, 使体质量减轻并长期维持, 从而改善患者临床症状、预防或延缓 PCOS 患者远期并发症的发生发展。然而, 患者对健康教育内容依从性较差。本文旨在阐述近年来影响 PCOS 患者健康教育依从性的因素及提高患者依从性的措施。

【关键词】 依从性; 多囊卵巢综合征 (PCOS); 健康教育; 生活方式指导

Influencing factors and improving measures of health education compliance in patients with polycystic ovary syndrome

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【Abstract】 Polycystic ovary syndrome (PCOS) is a common reproductive endocrine disease in reproductive age women, and its clinical manifestations are menstrual disorders, hairy acne, infertility, obesity and so on. The incidence of PCOS was increasing constantly in recent years. Studies have shown that health education can promote patients to form a good lifestyle, which can lead to weight loss and long-term maintenance, thereby improving the clinical symptoms and preventing or delaying the occurrence and development of long-term complications in patients with PCOS. However, patients have less compliance with health education content. The paper aims to review the compliance factors of health education in patients with PCOS and the effective measures to improve patient compliance.

【Key words】 Compliance; Polycystic ovary syndrome (PCOS); Health education; Lifestyle guidance

常用麻醉药对雄性生殖毒性的研究现状

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【摘要】 近年来, 随着不孕难题的日益突出, 麻醉药品生殖毒性问题备受关注。有研究发现多种全身麻醉药物如阿片类镇痛药、氟烷类药物, 局部麻醉药物如可卡因、利多卡因等可能削弱雄性生育力, 具体机制尚无统一定论。本文回顾临床常用毒麻药物及其代谢产物可能雄性生殖毒性的研究现状和进展, 以希望加深对男性不育症的认识, 为未来新麻醉药物的研发提供崭新的思路。

【关键词】 麻醉药; 镇痛药; 雄性; 生殖毒性

· 综 述 ·

Research progress on male reproductive toxicity of clinical anesthetics *Tang Xianan, Yang Tao, Yue Jing, Zhang Yi*
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【Abstract】 Recently, with the increasing occurrence of infertility problems, the reproductive toxicity of anesthetics draws much attention. It's reported that general anesthetics like opioids, isoflurane and local anesthetics like cocaine and lidocaine might impair male fertility, but the mechanism has not reach a consensus. This review concerns the potential male reproductive toxicity of clinical anesthetics and its metabolites, to progress further acknowledgement of male infertility and facilitate the development of future anesthetics.

【Key words】 Anesthetics; Analgesics; Male; Reproductive toxicity